210 may have the same, less, or greater magnitude current as the initial prepulse 202 and e.g., has a current I2 that is limited to 3mA to 7mA. It should be understood that while two prepulses, i.e., prepulses 202 and 210, are shown in Fig. 5, any desired number of prepulses maybe used.

cont B1

In the Claims

Please amend claims 5, 8, 9, 10, 13, 18, 19, 24 and 25 as follows. The following is a clean version of the entire set of pending claims.

1. (Amended) A method of programming an antifuse, said antifuse comprising a material that is substantially non-conductive when said antifuse is unprogrammed, said material being disposed between and in electrical contact with a first conductive element and a second conductive element, said method comprising:

passing a current limited pulse through said material so as to drive material from said first conductive element into said material as a conductive filament; and

passing a second pulse through said material in the opposite direction of said current limited pulse so as to drive material from said second conductive element into said material thereby increasing the cross sectional area of said conductive filament and reducing the resistance of said antifuse;

wherein the current in said current limited pulse is lower in magnitude than the current in said second pulse, and wherein said current limited pulse is passed through said material prior to any non-current limited pulse.

2. The method of Claim 1, wherein said current limited pulse and said second pulse have approximately the same voltage with opposite polarity.

3. The method of Claim 1, wherein said current in said current limited pulse is 20 to 33 percent lower in magnitude than said current in said second pulse.

4. (ALLOWED) A method of programming an antifuse, said antifuse comprising a material that is substantially non-conductive when said antifuse is unprogrammed, said

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material being disposed between and in electrical contact with a first conductive element and a second conductive element, said method comprising:

passing a current limited pulse through said material so as to drive material from said first conductive element into said material as a conductive filament;

passing a second pulse through said material in the opposite direction of said current limited pulse so as to drive material from said second conductive element into said material thereby increasing the cross sectional area of said conductive filament and reducing the resistance of said antifuse; and

passing a third pulse through said material in the same direction as the current limited pulse, said third pulse being greater in magnitude than said current limited pulse, said third pulse further reducing the resistance of said antifuse,

wherein the current in said current limited pulse is lower in magnitude than the current in said second pulse, and wherein said current limited pulse is passed through said material prior any non-current limited pulse.

Sub Cl B2

5. (Presently Amended) The method of Claim 1,

wherein passing said current limited pulse through said material comprises applying a first voltage to said first conductive element and applying a second voltage to said second conductive element, said second voltage being greater in magnitude than said first voltage, and limiting the current to a desired magnitude; and

wherein passing said second pulse through said material comprises applying said second voltage to said first conductive element and applying said first voltage to said second conductive element.

6. The method of Claim 1, wherein said material comprises amorphous silicon and said conductive filament comprises silicide.

7. (Amended) The method of Claim 1, further comprising passing a plurality of current limited pulses through said material prior to passing said second pulse through said material.

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8. (Presently Twice Amended) The method of Claim 7, wherein passing said plurality of current limited pulses through said material comprises passing at least two current limited pulses through said material, said at least two current limited pulses being opposite in polarity.

9. (Presently Twice Amended) A method of programming an antifuse, said antifuse comprising a material that is substantially non-conductive when said antifuse is unprogrammed, said material being disposed between and in electrical contact with a first conductive element and a second conductive element, said method comprising:

applying a prepulse to said material, said prepulse having a current of a first magnitude that drives material from said first conductive element into said material as a conductive filament; and

applying a programming pulse to said material, said programming pulse having a current of a second magnitude that drives material from said second conductive element into said material adding to said conductive filament;

wherein said current of said first magnitude is lower than said current of said second magnitude, and wherein said prepulse is applied prior to applying any programming pulses.

10. (Presently Amended) The method of Claim 9, wherein said current of said second magnitude is 20 to 33 percent greater in magnitude than said current of said first magnitude.

11. The method of Claim 9,

wherein said prepulse has a first voltage applied to said first conductive element and a second voltage applied to said second conductive element; and

wherein said first programming pulse has said second voltage applied to said first conductive element and said first voltage applied to said second conductive element.

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12. The method of Claim 9, wherein said current of said programming pulse is applied in the opposite direction of said current of said prepulse.

13. (Presently Amended) The method of Claim 12, further comprising applying a second programming pulse to said material, said second programming pulse having a current of a third magnitude, said current of said second programming pulse being applied in the same direction of said current of said prepulse.

14. The method of Claim 13, wherein said third magnitude is not greater than said second magnitude.

15. The method of Claim 13, wherein said third magnitude is greater than said second magnitude.

16. The method of Claim 13, further comprising repeatedly applying said first programming pulse and said second programming pulse a predetermined number of times.

17. The method of Claim 13, further comprising repeatedly applying said first programming pulse and said second programming pulse until the resistance of said antifuse is below a predetermined value.

18. (Presently Twice Amended) The method of Claim 9, further comprising applying at least one additional prepulse to said material prior to applying said programming pulse.

19. (Presently Twice Amended) A method of programming an antifuse, said antifuse comprising a material that is substantially non-conductive when said antifuse is unprogrammed, said material being disposed between and in electrical contact with a first conductive element and a second conductive element, said method comprising:

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applying a prepulse to said material, said prepulse having a current of a first magnitude that drives material from said first conductive element into said material as a conductive filament; and

applying a second prepulse to said material after said applying said first prepulse to said material, wherein said second prepulse has said current of a third magnitude;

applying a programming pulse to said material, said programming pulse having a current of a second magnitude that drives material from said second conductive element into said material adding to said conductive filament;

wherein said current of said first magnitude is lower than said current of said second magnitude, and wherein said prepulse is applied prior to applying said programming pulses;

wherein said current of said third magnitude is lower than said current of said second magnitude, wherein said current of said third magnitude has an opposite polarity from said current of said first magnitude, and wherein said second prepulse is applied prior to applying said programming pulse; and

wherein said first prepulse has approximately the same voltage with opposite polarity as said second prepulse.

20. The method of Claim 19, wherein said third magnitude is approximately equal to or greater than said first magnitude.

21. (Amended) A method of programming an antifuse, said antifuse comprising a material that is substantially non-conductive when said antifuse is unprogrammed, said method comprising:

applying a first voltage across said material and a first current through said material, said first current driving a conductive filament with a first cross sectional area through said material; and

applying a second voltage across said material and a second current through said material, said second voltage having the same magnitude and opposite polarity as

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said first voltage, said second current having a greater magnitude and opposite polarity as said first current, said second current increasing the size of said conductive filament to a second cross sectional area, said second cross sectional area being greater than said first cross sectional area;

wherein said first current having insufficient magnitude to produce a conductive filament with said second cross sectional area, and wherein said first current is applied through said material prior to any current which has sufficient magnitude to produce a conductive filament with said second cross sectional area.

22. (Amended) A method of programming an antifuse, said antifuse comprising a material that is substantially non-conductive when said antifuse is unprogrammed, said method comprising:

applying at least one prepulse to said material, said prepulse including a first current to drive a conductive filament through said material, said first current having insufficient magnitude to produce said conductive filament with a desired resistance; and

applying at least one programming pulse to said material after the application of said at least one prepulse, said programming pulse including a second current having a greater magnitude than said first current to increase the cross sectional area of said conductive filament and to decrease the resistance of said conductive filament to a desired resistance,

wherein said prepulse is applied prior to the application of any programming pulses.

23. The method of Claim 22, wherein said prepulse and said programming pulse have the same magnitude voltages with opposite polarities.

24. (Presently Twice Amended) The method of Claim 22, further comprising applying at least one additional prepulse to said material wherein said at least one prepulse and said at least one additional prepulse define a plurality of prepulses.

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25. (Presently Amended) The method of Claim 24, wherein said plurality of prepulses have currents of approximately the same magnitudes with each prepulse having a current of an opposite polarity from an immediately preceding prepulse.

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